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SUITE 700

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EXAMINER

GHULAMALI, QUTBUDDIN

ART UNIT

PAPER NUMBER

2611

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Please find below and/or attached an Office communication concerning this application or proceeding.



## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/12/2006 has been entered.

### ***Response to Remarks/Amendment***

2. Applicant's amendment, filed 05/12/2006, with reference to the rejection(s) of claim(s) 1, 2 and 4-7 under 35 U.S.C. 102(b) and rejection of claims 8-13, under 35 U.S.C 103(a) have been fully considered but they do not place the application in condition for allowance. The rejection follows.

### ***Claim Objections***

3. Claims 2, 3, 4, 5, 7, 9 and 11, are objected to because of the following informalities:

Claims 2, 3, 4 and 5, after "the step of converting", the words "the analog signal" needs to be inserted.

Claims 2, 3, lines 2 and 3 respectively, "predetermined timing" needs to be amended to read "predetermined sampling timing".

Claim 2, line 7, "a sampling" needs to be changed to "the sampling".

Claim 5, line 7, "a sampling value" needs to be replaced with "the plurality of sampling values".

Claims 9 and 11, lines 2 and 3, respectively, the first occurrence of "between" needs to be replaced with "to".

Claim 18 is objected to because of the following informalities: In claim 18, line 4, "predicable" should be changed to -- predictable -- to correct typographical error. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 4-7, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumishita (USP 5,721,546) in view of Kashida et al (USP 5,400,148).

Regarding claims 1, 6, Tsutsumishita discloses an analog control method comprising:  
converting the analog signal to a digital signal via a first path (figs. 1, 2, 4; col. 12, lines 22-31);

performing an arithmetic processing of the digital signal via the first path to generate a control signal for controlling the analog signal (col. 7, lines 1-28; col. 12, lines 22-26). The Tsutsumishita reference however, does not explicitly disclose a second path with a delay for delaying the analog signal. Kashida however, discloses a second path with a delay element (timing control with delay, element 86) delaying the analog signal corresponding to a latency caused by the generation of the control signal to generate a delayed analog signal in a second path that is different from the first path (the A/D path) (col. 5, lines 7-24; col. 6, lines 39-46) and controlling the delayed analog signal in accordance with the control signal in the second path. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a delay circuit to delay analog signal in a second path in the analog control circuit with control as taught by Kashida in the circuit of Tsutsumishita because by providing the delay that is equivalent to the ADC latency can mitigate time differences in the analog signal processing corresponding to the latency of the ADCs.

As per claim 2, Tsutsumishita discloses:

sampling the analog signal at a predetermined timing to generate a sampling value (the A/D circuit by design converts the analog signal in discrete steps taken as predetermined time values of analog signal to produce a sample value) (figs. 1, 2, 4; 26, 28; col. 12, lines 22-31, 40-51); generates control signal (predicted position data) in accordance with the sampling value (col. 7, lines 1-28; col. 12, lines 22-26); and inherent to the analog to digital conversion is the delay, in sampling the signal having a sampling value correspond to the

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predetermined sampling time taken in discrete steps (figs. 1, 2, 4; 26, 28; col. 12, lines 22-31, 40-51).

As per claims 4 and 5, Tsutsumishita discloses:  
sampling the analog signal at a plurality of predetermined timing to generate a plurality of sampling values (the ADC circuit by design converts the analog signal in discrete steps taken as predetermined time values of analog signal to produce a sample value) (figs. 1, 2, 4; 6, 26, 28; col. 8, lines 39-52; col. 12, lines 22-31, 40-51);  
calculating the plurality of sampling values to generate control signal (predicted position data) in accordance with the sampling value (col. 7, lines 1-28; col. 12, lines 22-26); and  
inherent to the analog to digital conversion is the delay, in sampling the signal having a sampling value correspond to an arbitrary sampling time or at a timing previous to each sampling taken in discrete steps to reproduce analog signal in quantized steps (figs. 1, 2, 4; 26, 28; col. 12, lines 22-31, 40-51).

As per claim 7, Tsutsumishita discloses an analog signal control comprising:  
An analog-to-digital (ADC) signal conversion, the ADC (element 8A, 8B) located in the first path and converting an analog signal to generate a digital signal (figs. 1, 2, 4; col. 12, lines 22-31);  
A digital arithmetic circuit (element 9) located in the first path and connected to the ADC for performing an arithmetic processing of the digital signal to generate a control signal for controlling the analog signal (col. 7, lines 1-28; col. 12, lines 22-26). The Tsutsumishita reference however, does not explicitly disclose a delay circuit located in a second path that is different from the first path, and delaying the analog signal

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corresponding to a latency caused by the ADC and the digital arithmetic circuit to generate a delayed analog signal, and an analog control circuit, located in the second path.

Kashida, however, discloses a second path with a delay element (timing control with delay, element 86) delaying the analog signal corresponding to a latency caused by the ADC and the digital arithmetic circuit to generate a delayed analog signal and an analog control circuit connected to the digital arithmetic unit and delay for controlling the delayed analog input signal (col. 5, lines 7-24; col. 6, lines 39-46). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a delay circuit to delay analog signal in a second path in the analog control circuit with control as taught by Kashida in the circuit of Tsutsumishita because by providing the delay that is equivalent to the ADC latency can mitigate time differences in the analog signal processing corresponding to the latency of the ADCs.

Regarding claim 14, Tsutsumishita discloses an automatic gain control comprising:

A first control loop located in a path for receiving an analog signal to generate a control signal for setting a predetermined gain for use in amplifying the analog signal (figs. 1, 2, 4; col. 12, lines 22-31). Tsutsumishita is silent regarding:

a delay circuit located in a path that is different from the first path for receiving the analog signal and delaying an analog signal corresponding to a latency caused by the first loop to generate a delayed a delayed analog signal; and a gain control amplifier located in the second path and connected to the delay circuit and the first loop for

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amplifying the delayed analog signal in accordance with a predetermined gain set by the control signal to generate an amplified analog signal. Kashida discloses a delay circuit (timing control with delay, element 86) located in a path that is different from the first path for receiving the analog signal and delaying an analog signal corresponding to a latency caused by the first loop to generate a delayed a delayed analog signal; and a gain control amplifier (elements 30, 32 with 31, 33) located in the second path and connected to the delay circuit and the first loop for amplifying the delayed analog signal in accordance with a predetermined gain set by the control signal to generate an amplified analog signal (col. 1, lines 37-50, 51-60). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a delay circuit to delay analog signal in a second path in the analog control circuit with control and gain control amplifier as taught by Kashida in the circuit of Tsutsumishita because by providing the delay that is equivalent to the ADC latency can mitigate time differences in the analog signal processing corresponding to the latency of the ADCs.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumishita (USP 5,721,546) in view of Oishi et al (US Patent 6,563,859).

Regarding claim 8, Tsutsumishita discloses an analog signal controller wherein: the analog signal controller operates in accordance with a clock signal (col. 1, lines 30-35; col. 2, lines 15-44). Tsutsumishita however is silent regarding "the delay circuit includes a pair of switches which operate complementary to each other in synchronism with the clock signal, and delays the analog signal by switching the pair of switches".



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Oishi in a similar field of endeavor discloses a plurality of delay switches (fig. 12501-1 to 501-N), which operate complementary to each other in synchronism with the clock signal, and delays the analog signal by switching the plurality of switches (col. 11, lines 18-34). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use delay switches to delay analog signals (sampling period of the A/D converters) in synchronism with the clock signal as taught by Oishi in the circuit of Tsutsumishita because it can provide equalization in frequency shift of the received signal to be extracted.

7. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumishita (USP 5,721,546) in view of Gurvich (US Patent 6,897,724).

Regarding claims 12 and 13, Tsutsumishita discloses all of the claim limitations but is silent regarding a delay circuit includes a capacitor having a capacitance (variable) value for delaying the analog signal corresponding to latency (delay, error). Gurvich in a similar field of endeavor shows a system wherein capacitors are used in the delay circuit for delaying the signal, shows the capacitor could be a variable capacitor such as a varactor (variable capacitor) (col. 5, lines 25-50). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use fixed or variable capacitors at the switch nodes as taught by Gurvich in the circuit of Tsutsumishita because it can allow proper group delay adjustments with the transmission of signal in the transmission line.

**Allowable Subject Matter**

8. Claims 15-23 allowed.
9. Claims 3 and 9-11, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and any claim objections noted above.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**US Patents:**

US Patent 6,222,478, to Bright.

US Patent 6,252,464, to Richards et al.

US Patent 6,192,089, to Corleto et al.

US Patent 6,148,045, to Taura et al.

US Patent 5,566,211, to Choi.

US Patent 6,005,889, to Chung et al.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.  
July 26, 2006.

  
MOHAMMED GHAYOUR  
SUPERVISORY PATENT EXAMINER